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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Hamre, Schumann, Mueller & Larson, P.C.
P.O. Box 2902
Minneapolis, MN 55402-0902

EXAMINER	
VERDERAME, ANNA L	
ART UNIT	PAPER NUMBER
1795	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/525,296	UNO ET AL.	
	Examiner	Art Unit	
	ANNA L. VERDERAME	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 10-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 10-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The response filed on 12/17/2008 has been carefully considered. A response is presented below.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-10 and 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitaura et al. US 2002/0122366 in view of K. Nishiuchi, H. Kitaura, N. Yamada, and N. Akahira. Japanese Journal of Applied Physics. 37(1998) 2163.

3. In example 3 of Kitaura et al. a 4-layer optical recording medium is disclosed. The fourth recording layer is made of Te-O-Pd and has a thickness of 20 nm, the third recording layer is made of Te-O-Pd and has a thickness of 10 nm, The second recording layer is made of Te-O-Pd and has a thickness of 8 nm and the first recording layer is made of Te-O-Pd and has a thickness of 6 nm (0098-0103). The medium of the copending application is a write-once optical recording medium and thus the change upon recording is irreversible (abstract). The Te-O-M recording material is described at (0039-0041). Optical constants for the Te-O-Pd recording layer are disclosed at (0093). A reactive sputtering method for forming the Te-O-Pd layers is disclosed at (0103). A mixed gas atmosphere of Argon and Oxygen is used. Te-Pd targets are disclosed at for example (0102).

Kitaura et al. does not explicitly teach the limitations of the instant claims regarding the transmittance of the crystalline and amorphous phases of the j-th recording layer. The reference further does not explicitly disclose the limitations of instant claims 2-3 and 13.

Nishiuchi et al. discloses the transmittance for a Te-O-Pd film in both the crystalline and the amorphous phase as a function of thickness (figure 3). The Te-O-Pd film used is $Te_{42}O_{46}Pd_{12}$ (p.2164 first column). Films having a thickness of 6 nm meet the limitations recited in instant claims 1, 3, 13, and 16.

It would have been obvious to use the $Te_{42}O_{46}Pd_{12}$ material taught by Nishiuchi in the 4-layer optical recording medium taught in the copending application based on the use of Te-O-Pd films and based on the fact that the composition taught by Nishiuchi falls within the desired ranges for the Te-O-Pd composition recited in the copending application at (0039-0041) and with a reasonable expectation of forming a multi-layer optical recording medium that meets the limitations recited in the instant claims.

With regard to the limitations regarding variation of the amount of oxygen and/or metal in each recording film, it is the position of the examiner that these are known result-effective variables and thus it would be obvious to optimize *In re Boesch*, 617 F.2d 272, 205 USPQ 215. At (0040) Kitaura teaches that when O atoms are contained in the film in an amount less than 25 at % the heat conductivity of the recording layer may be too high which may result in large

recording marks and that when O-atoms are in the amount of 60 at% or more the heat conductivity of the recording layer may be too low which may prevent a sufficiently large recording mark from being formed. Thus it is shown that increasing the O-atom concentration has the predictable result of decreasing the conductivity of the film and decreasing the O-atom concentration has the predictable result of increasing the conductivity of the film. At (0041) Kitaura et al. discloses that when M atoms are present in an amount less than 1 at% the growth of Te crystals during crystallization which may cause insufficient crystallization speed and when M atoms are in an amount more than 35 at% that the reflectance difference between the amorphous and crystalline states may become too small which may lower the C/N ratio. Thus it would be obvious to optimize to obtain a film having good sensitivity and a high C/N ratio. Kitaura et al. also recognizes that the thickness of the recording layer affects the properties of the layer (0043). When the thickness of the layer is less than 2nm sufficient reflectance and change in reflectance may not be provided and the C/N may be lowered. When the thickness of the recording layer is more than 70 nm the thermal diffusion in the film may be increased so that the C/N ratio may be lowered. Thin layers are going to be able to dissipate heat faster than thicker layers and thin layers are going to be more transmissive than thicker layers. Further, in a multi-level medium the ability to access further recording layers is taken into consideration (0033). If for example a first recording layer is too reflective access to further recording layers is limited. Based on this disclosure it

would be obvious to one of ordinary skill in the art to optimize the thickness and the composition of each of the recording layers of a multi-level medium.

The examiner points to sections (0021-0022) of the applicant's specification which disclose effects achieved by varying the M-atom and O-atom concentration in the recording films. The ultimate goal is to form a medium having a high C/N and high-transmittance (so the laser can reach further layers). Adjustment of the M-atom concentration is done to achieve high sensitivity and transmittance.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitaura et al. US 2002/0122366 in view of K. Nishiuchi, H. Kitaura, N. Yamada, and N. Akahira. Japanese Journal of Applied Physics. 37(1998) 2163 as applied above and further in view of Imaino et al. US 5,555,537.

5. Kitaura et al. US 2002/0122366 in view of K. Nishiuchi, H. Kitaura, N. Yamada, and N. Akahira. Japanese Journal of Applied Physics. 37(1998) 2163 does not teach the limitation of claim 11.

Imaino et al. teaches sub-oxide recording materials for use in write-once optical recording media. TeO_x, GeO_x, and SbO_x films having metallic additives such as Pd, Ni, or Cu are disclosed at (10/28-29).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the 4-layer optical recording medium rendered obvious by the combination of Kitaura et al. in view of Nishiuchi et al. by forming one or both

of the third and fourth recording layers of a recording material such as Ge-O-Pd or Sb-O-Pd based on the disclosure of these materials for use in write-once optical recording media and with a reasonable expectation of forming an optical recording medium that still meets the limitations recited in instant claims, especially claims 1-3 and 13.

Double Patenting

6. The double patenting rejection over claims 1-18 of U.S. Patent No. 6,768,710 in view of K. Nishiuchi, H. Kitaura, N. Yamada, and N. Akahira. Japanese Journal of Applied Physics 37(1998) 2163 is withdrawn due to applicant's amendment of the claims.

Response to Arguments

7. Applicant's arguments filed 12/17/2008 have been fully considered but they are not persuasive. The applicant's main argument is that the combination of references does not explicitly recite the variation of oxygen content wherein the information layer provided on the laser beam incidence side has a lower concentration of oxygen atoms. The examiner has put forth an argument which establishes that oxygen content, metal content, and layer thicknesses are shown to be result effective variables and that it would have been obvious to optimize these variables to arrive at the claimed invention. Metal content and thickness of the layer are shown to effect the transmissivity of the layer. A high metal content results in a more reflective(less transmissive) layer. A high

reflectivity layer prevents laser access to further recording layers in a multilayer medium. Layer thickness, oxygen content and metal content have been shown to effect the heat conductivity(dissipation) of the layer. A thin layer will be more heat dissipative than a thicker layer. A layer having a higher metal content will be more heat dissipative than a layer having a lower metal content. A layer having a higher oxygen content will be less heat dissipative than a layer having a lower oxygen content. All of these parameters should be optimized. The recording layer nearest the light incident plane should be highly transmissive so that other layers can be accessed and should have good heat conductivity since it is nearest the light incidence plane. The applicant has not addressed this argument which was presented by the examiner at all. This argument can be addressed by showing that having the recording layer nearest the laser incidence side have a lower concentration of oxygen atoms produces an unpredictable result.

On page 10-11 of the response the applicant states that by including less oxygen atoms in a recording layer closer to the laser beam a good C/N ratio and a high transmittance is obtained. These results are shown to be obtained by manipulating the M-content, O-content, and thickness of the layer.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA L. VERDERAME whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark F. Huff/
Supervisory Patent Examiner, Art Unit 1795

/Anna L Verderame/
Examiner, Art Unit 1795